

# NASA Space Radiation Risk Tools



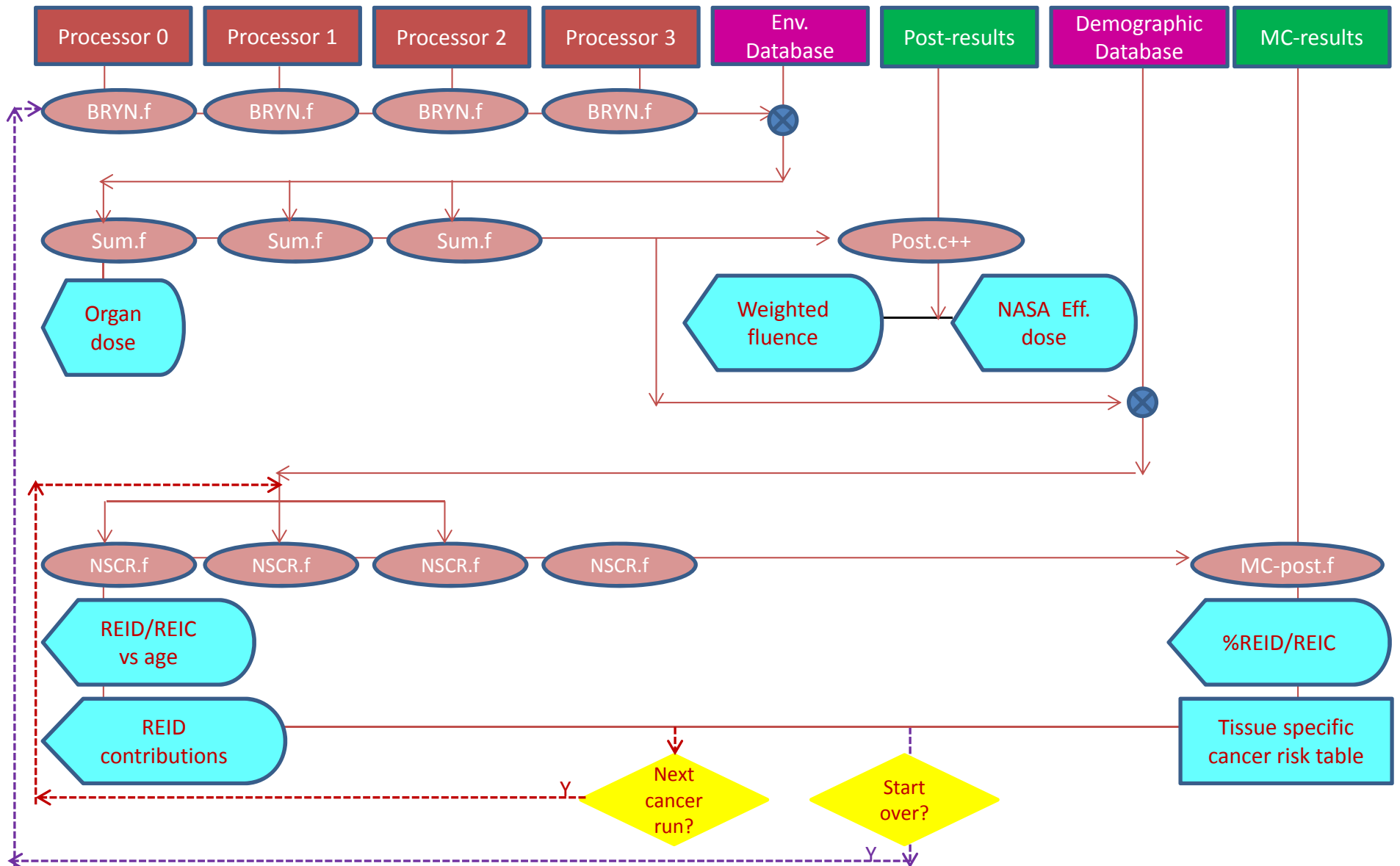
**NASA Human Research Program  
Space Radiation Program Element**

**Division of Space Life Sciences  
Universities of Space Research Association**

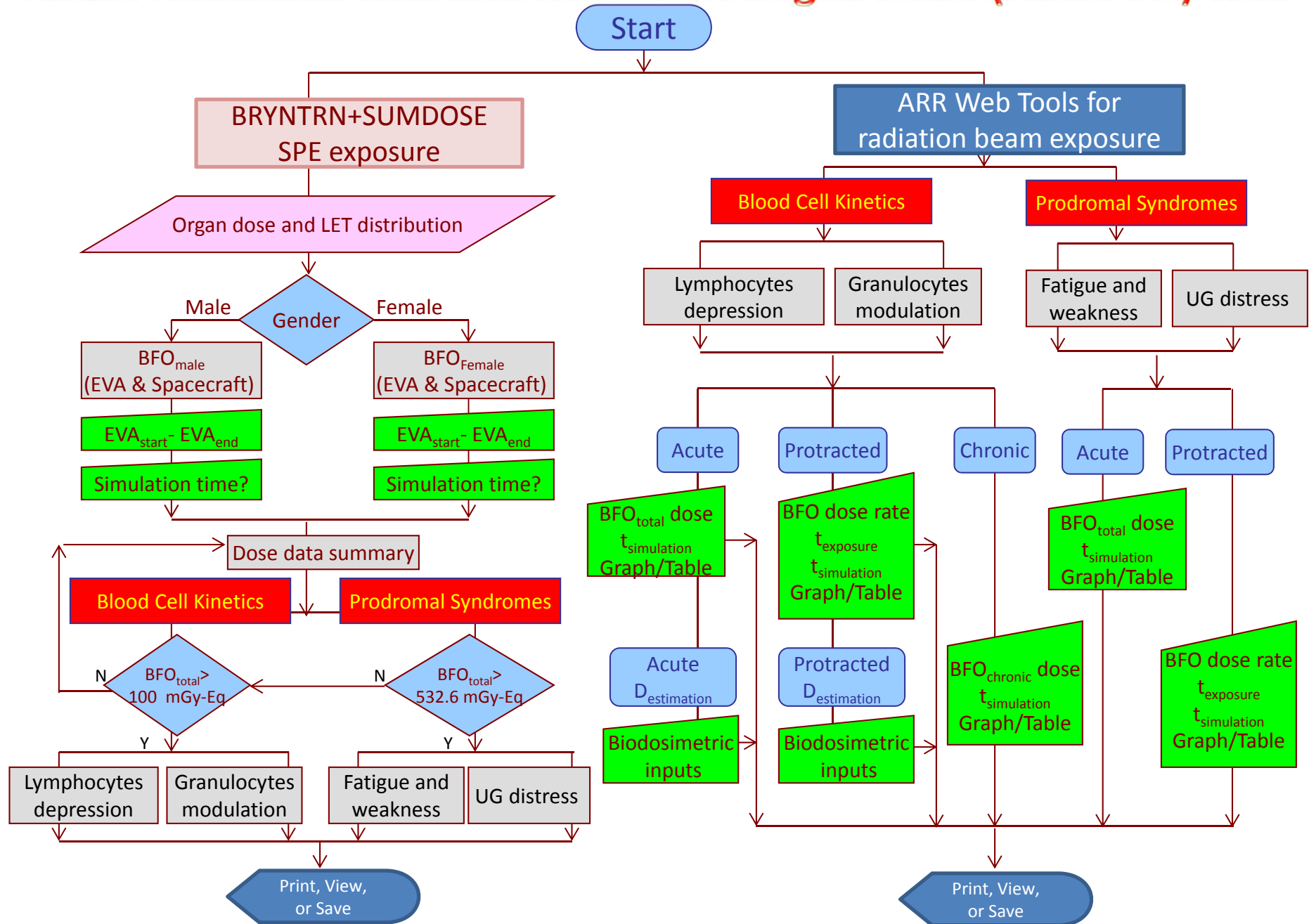
# NASA Space Radiation Risk Tools

- **NSCR: NASA Space Cancer Risk**  
Projection of cancer risk from exposure to space radiation
- **ARRBOD: Acute Radiation Risk and BRYNTRN (Baryon Transport) Organ Dose**  
Organ dose projection and acute radiation risk calculation from exposure to SPE (solar particle event)
- **GERMcode: GCR (Galactic Cosmic Ray) Event-based Risk Model (GERM) code**  
Basic physical and biophysical properties for an ion beam, and  
Biophysical and radiobiological properties for a beam transport to the target in the NSRL (NASA Space Radiation Laboratory) beam line
- **RITRACKS: Relativistic Ion TRACKS**  
Simulation of heavy ion and  $\delta$ -ray tracks in biomolecules
- **NASARTI: NASA Radiation Track Image**  
Modeling of the effects of space radiation on human cells and tissue by incorporating a physical model of tracks, cell nucleus, and DNA damage foci with image segmentation for the automated count

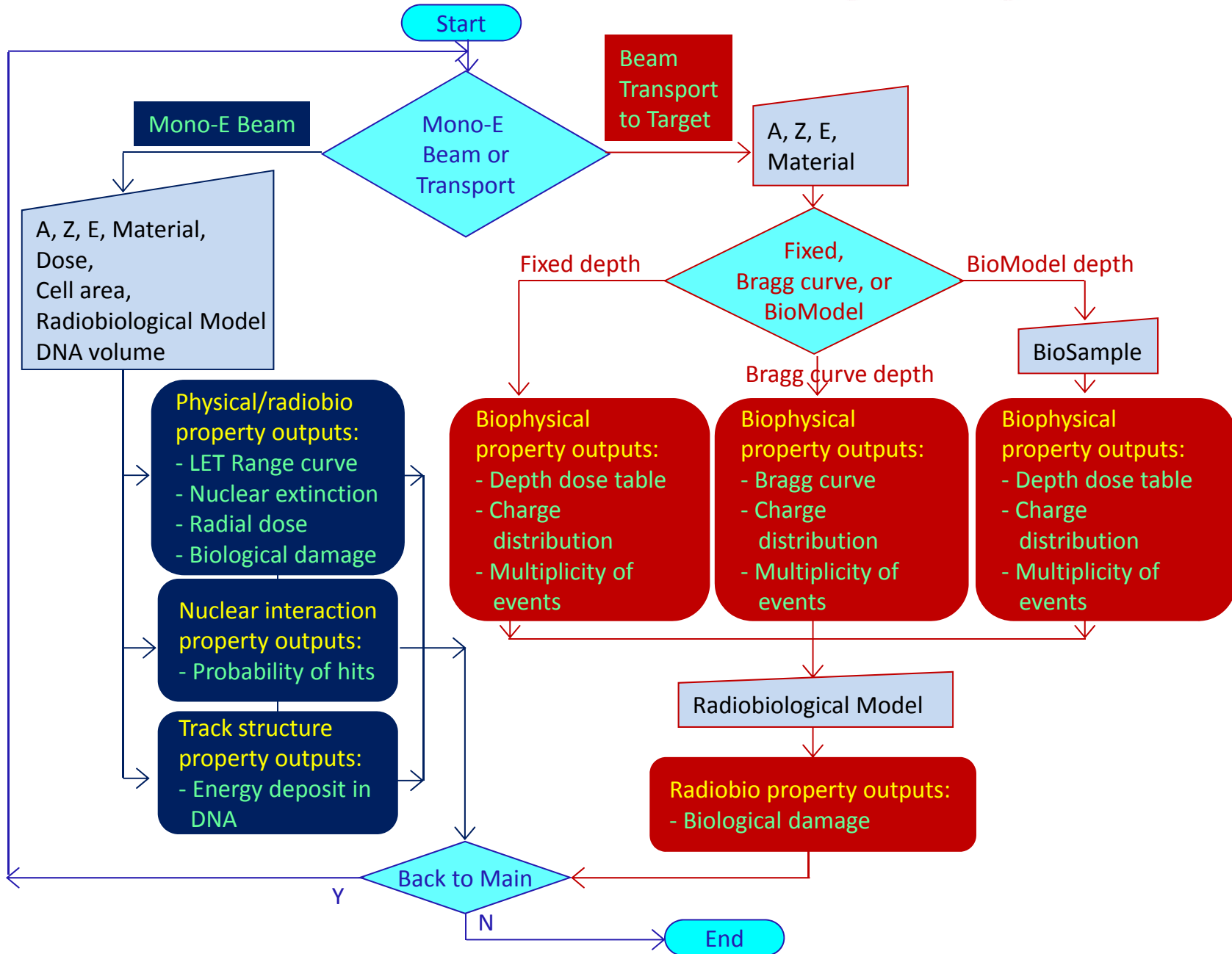
# NASA Space Cancer Risk (NSCR) v1.0



# Acute Radiation Risk and BRYNTRN Organ Dose (ARRBOD) v2.0



# GCR Event-based Risk Model (GERM) v1.1

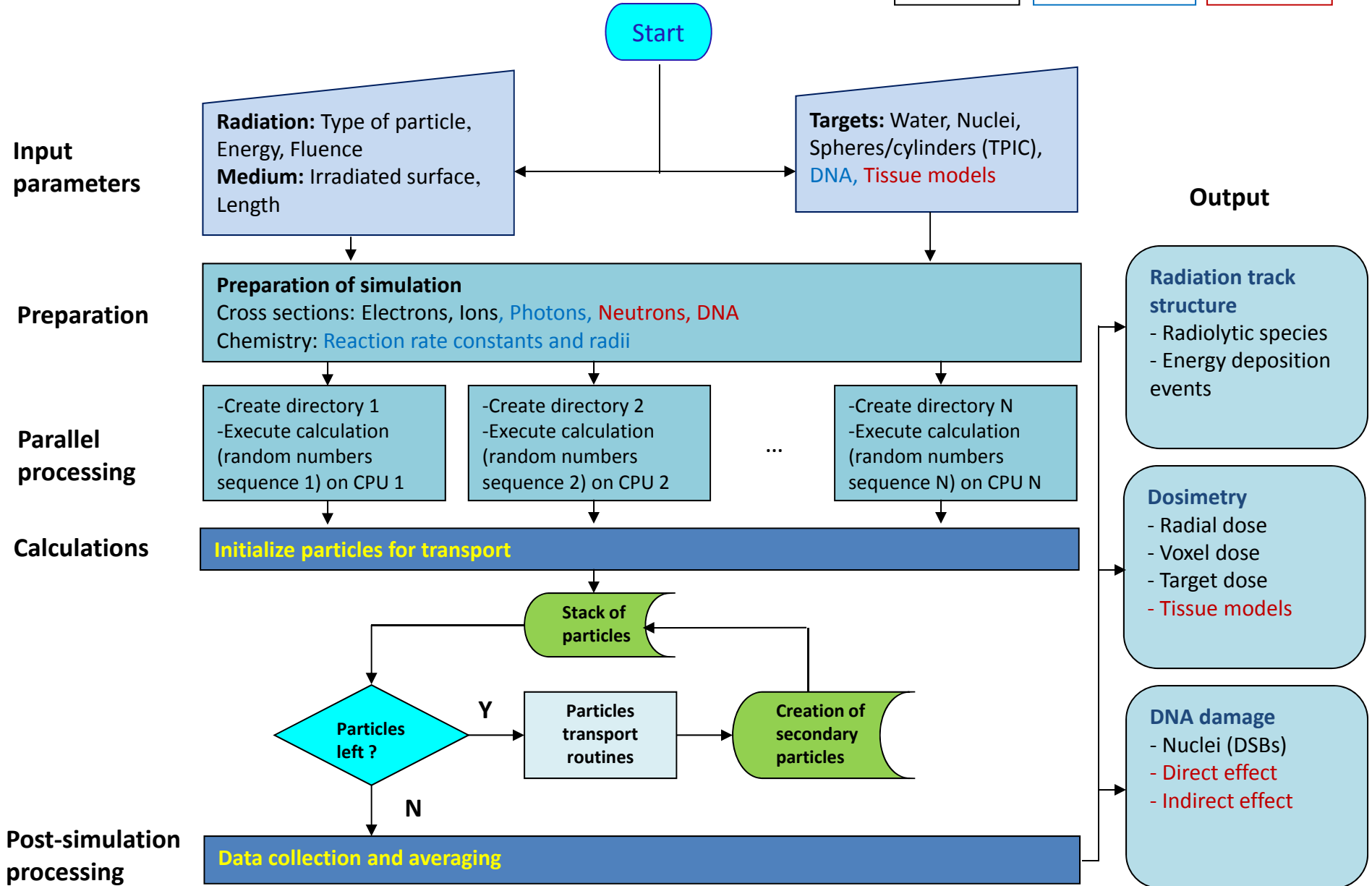


# RITRACKS v3.0

Version 3  
(actual)

Version 4 (in  
progress)

Version 5  
(planned)



# NASA Radiation Track Image (NASARTI) v3.0

